Contents of Volume 116

Volume 116 Nos. 1–2 November 1999

Special Issue:
Forest Growth Responses to the Pollution Climate of the 21st Century

Guest-editors:
Lucy J. Sheppard and J. Neil Cape

Preface	1
Acknowledgements	3
D. FOWLER, J.N. CAPE, M. COYLE, C. FLECHARD, J. KUYLENSTIERNA, K. HICKS, D. DERWENT, C. JOHNSON and D. STEVENSON / The Global Exposure of Forests to Air Pollutants	5–32
H. SPIECKER / Overview of Recent Growth Trends in European Forests	33–46
H. RENNENBERG and A. GESSLER / Consequences of N Deposition to Forest Ecosystems – Recent Results and Future Research Needs	47–64
B.A. EMMETT / The Impact of Nitrogen on Forest Soils and Feedbacks on Tree Growth	65–74
M.F. HOVMAND and J. BILLE-HANSSEN / Atmospheric Input to Danish Spruce Forests and Effects on Soil Acidification and Forest Growth Based on 12 Years Measurements	75–88
U. SKIBA, L.J. SHEPPARD, C.E.R. PITCAIRN, S. VAN DIJK and M.J. ROSSALL / The Effect of N Decomposition on Nitrous Oxide and Nitric Oxide Emissions from Temperate Forest Soils	89–98
W. FLÜCKIGER and S. BRAUN / Nitrogen and Its Effect on Growth, Nutrient Status and Parasite Attacks in Beech and Norway Spruce	99–110
M. CARNOL, P. CUDL´N and P. INESON / Impacts of $(NH_4)_2SO_4$ Deposition on Norway Spruce (*Picea Abies* [L.] Karst) Roots	111–120
T. STASZEWSKI, S. GODZIK, P. KUBIESA and J. SZDZUJ / Fate of Nitrogen Compounds Deposited to Spruce (*Picea Abies* Karst.) and Pine (*Pinus Silvestris* L.) Forests Located in Different Air Pollution and Climatic Conditions	121–127
P. SCHLEPPI, I. BUCHER-WALLIN, R. SIEGWOLF, M. SAURER, N. MULLER and J.B. BUCHER / Simulation of Increased Nitrogen Deposition to a Montane Forest Ecosystem: Partitioning of the Added ^{15}N	129–134
J. WÖLLECKE, B. MÜNZENBERGER and R.F. HÜTTL / Some Effects of N on Ectomycorrhizal Diversity of Scots Pine (*Pinus Sylvestris* L.) in Northeastern Germany	135–140
A. BYTNEROWICZ, S. GODZIK, M. POTH, I. ANDERSON, J. SZDZUJ, C. TOBIAS, S. MACKO, P. KUBIESA, T. STASZEWSKI and M. FENN / Chemical Composition of Air, Soil and Vegetation in Forests of the Silesian Beskid Mountains, Poland	141–150
S. McLAUGHLIN and K. PERCY / Forest Health in North America: Some Perspectives on Actual and Potential Roles of Climate and Air Pollution	151–197
R. MATYSSEK and J.L. INNES / Ozone – A Risk Factor for Trees and Forests in Europe?	199–226
J.M. SKELLY, J.L. INNES, J.E. SAVAGE, K.R. SNYDER, D. VANDERHEYDEN, J. ZHANG and M.J. SANZ / Observation and Confirmation of Foliar Ozone Symptoms of Native Plant Species of Switzerland and Southern Spain	227–234
N.E. GRULKE and L. BALDUMAN / Deciduous Conifers: High N Deposition and O_3 Exposure Effects on Growth and Biomass Allocation in Ponderosa Pine	235–248
M. TAUSZ, A. BYTNEROWICZ, W. WEIDNER, M.J. ARBAUGH, P. PADGETT and D. GRILL / Changes in Free-Radical Scavengers Describe the Susceptibility of *Pinus Ponderosa* to Ozone in Southern Californian Forests	249–254
A. CHAPPELKA, G. SOMERS and J. RENFRO / Visible Ozone Injury on Forest Trees in Great Smoky Mountains National Park, USA	255–260

A. CHAPPELKA, J. SKELLY, G. SOMERS, J. RENFRO and E. HILDEBRAND / Mature Black Cherry Used as a Bioindicator of Ozone Injury 261–266
E. GRAVANO, M. FERRETTI, F. BUSSOTTI and P. GROSSONI / Foliar Symptoms and Growth Reduction of *Ailanthus altissima* Desf. in an Area with High Ozone and Acidic Deposition in Italy 267–272
R. INCLÁN, A. RIBAS, J. PEÑUELAS and B.S. GIMENO / The Relative Sensitivity of Different Mediterranean Plant Species to Ozone Exposure 273–277
R.L. HEATH / Biochemical Processes in an Ecosystem: How Should They Be Measured? 279–298
M.S.J. BROADMEADOW, J. HEATH and T.J. RANDLE / Environmental Limitations to O_3 Uptake – Some Key Results from Young Trees Growing at Elevated CO_2 Concentrations 299–310
D.F. KARNOSKY, B. MANKOVSKA, K. PERCY, R.E. DICKSON, G.K. PODILA, J. SOBER, A. NOORMETS, G. HENDREY, M.D. COLEMAN, M. KUBISKE, K.S. PREGITZER and J.G. ISEBRANDS / Effects of Tropospheric O_3 on Trembling Aspen and Interaction with CO_2: Results from an O_3-Gradient and a Face Experiment 311–322
M.S. GÜNTHARDT-GOERG, S. MAURER, J. BOLLIGER, A.J. CLARK, W. LANDOLT and J.B. BUCHER / Responses of Young Trees (Five Species in a Chamber Exposure) to Near-Ambient Ozone Concentrations 323–332
S. MANNINEN, D. LE THIEC, C. ROSE, G. NOURRISSON, F. RADNAI, J.P. GARREC and S. HUTTUNEN / Pigment Concentrations and Ratios of Aleppo Pine Seedlings Exposed to Ozone 333–338
R.M. COX and J.W. MALCOLM / Passive Ozone Monitoring for Forest Health Assessment 339–344
G. GEROSA, F. SPINAZZI and A. BALLARIN DENTI / Tropospheric Ozone in Alpine Forest Sites: Air Quality Monitoring and Statistical Data Analysis 345–350
M. FERRETTI, I. BONINI, F. BUSSOTTI, C. CELESTI, E. CENNI, A. CHIARUCCI, A. COZZI, V. DE DOMINICIS, P. GROSSONI and C. LEONZIO / Short-Term Changes of Response Indicators of Ecosystem Status in Broadleaved Forests in Tuscany (Central Italy) 351–356
S. BRAUN, B. RIHM, C. SCHINDLER and W. FLÜCKIGER / Growth of Mature Beech in Relation to Ozone and Nitrogen Deposition: An Epidemiological Approach 357–364
M.V. KOZLOV and P. NIEMELÄ / Difference in Needle Length – A New and Objective Indicator of Pollution Impact on Scots Pine (*Pinus sylvestris*) 365–370
M. FERRETTI, F. BUSSOTTI, E. CENNI and A. COZZI / Implementation of Quality Assurance Procedures in the Italian Programs of Forest Condition Monitoring 371–376
F. BATIÍ, P. KALAN, H. KRAIGHER, H. ŠIRCELJ, P. SIMONÍIÍ, N. VIDERGAR-GORJUP and B. TURK / Bioindication of Different Stresses in Forest Decline Studies in Slovenia 377–382
G. THELIN, U. ROSENGREN-BRINCK and B. NIHLGÅRD / Can Graphical Vector Analysis be Used to Identify Micro Nutrient Deficiency? 383–388
J. NEIRYNCK and P. ROSKAMS / Relationships Between Crown Condition of Beech (*Fagus sylvatica* L.) and Throughfall Chemistry 389–394
W. PRUS-GLOWACKI, A. WOJNICKA-POLTORAK, J. OLEKSYN and P.B. REICH / Industrial Pollutants Tend to Increase Genetic Diversity: Evidence from Field-Grown European Scots Pine Populations 395–402
J.L.J. HOUPIS, P.D. ANDERSON, J.C. PUSHNIK and D.J. ANSCHEL / Among-Provenance Variability of Gas Exchange and Growth in Response to Long-Term Elevated CO_2 Exposure 403–412
J.C. PUSHNIK, D. GARCIA-IBILCIETA, S. BAUER, P.D. ANDERSON, J. BELL and J.L.J. HOUPIS / Biochemical Responses and Altered Genetic Expression Patterns in Ponderosa Pine (*Pinus ponderosa* Doug ex P. Laws) Grown under Elevated CO_2 413–422
A. WONISCH, M. TAUSZ, M. MÜLLER, W. WEIDNER, L.J. DE KOK and D. GRILL / Treatment of Young Spruce Shoots with SO_2 and H_2S: Effects on Fine Root Chromosomes in Relation to Changes in the Thiol Content and Redox State 423–428

D.C. GORDON and K.E. PERCY / Effect of UV-B Dose on Biosynthesis of Epicuticular Waxes in Blue Spruce (*Picea Pungens* Engelmann.) Primary Needles: Preliminary Investigation 429–436

A. AUGUSTAITIS / A New Imitative Model to Predict the Impact of Air Pollutants on Scots Pine Health and Radial Increment 437–442

K. PERCY, J. BUCHER, J. CAPE, M. FERRETTI, R. HEATH, H.E. JONES, D. KARNOSKY, R. MATYSSEK, G. MULLER-STARCK, E. PAOLETTI, U. ROSENGREN-BRINCK, L. SHEPPARD, J. SKELLY and G. WEETMAN / State of Science and Knowledge Gaps with Respect to Air Pollution Impacts on Forests: Reports from Concurrent IUFRO 7.04.00 Working Party Sessions 443–448

Volume 116 Nos. 3–4 December 1999

S.A. WASAY, S. BARRINGTON and S. TOKUNAGA / Efficiency of GAC for Treatment of Leachate from Soil Washing Process 449–460

F.P. SIVAL and M. STRIJKSTRA-KALK / Atmospheric Deposition of Acidifying and Eutrophicating Substances in Dune Slacks 461–477

T.W. BERGER and G.E. LIKENS / Effects of Acid Anion Additions (Trifluoroacetate and Bromide) on Soil Solution Chemistry of a Northern Hardwood Forest Soil 479–499

M. ERTEN-UNAL and B.G. WIXSON / Biotreatment and Chemical Speciation of Lead and Zinc Mine/Mill Wastewater Discharges in Missouri, U.S.A. 501–522

M.M.A. SHRIADAH / Heavy Metals in Mangrove Sediments of the United Arab Emirates Shoreline (Arabian Gulf) 523–534

C.P. ROONEY, R.C. MCLAREN and R.J. CRESSWELL / Distribution and Phytoavailability of Lead in a Soil Contaminated with Lead Shot 535–548

C. NYGÅRD and N.G.A. EKELUND / Effects of Lead ($PbCl_2$) on Photosynthesis and Respiration of the Bladder Wrack, *Fucus Vesiculosus*, in Relation to Different Salinities 549–565

G.A. VAN DEN BERG, J.P.G. LOCH, L.M. VAN DER HEIJDT and J.J.G. ZWOLSMAN / Mobilisation of Heavy Metals in Contaminated Sediments in the River Meuse, The Netherlands 567–586

O. PRAKASH, A.K. ALVA and S. PARAMASIVAM / Use of the Urease Inhibitor N-(n-Butyl)-Thiophosphoric Triamide Decreased Nitrogen Leaching from Urea in a Fine Sandy Soil 587–595

L. JI-ANG, C.H.Z. YAHUI, P. KUSCHK, F. EISMANN and D. GLINDEMANN / Phosphine in the Urban Air of Beijing and its Possible Sources 597–604

F. CASSEL SHARMASARKAR, S. SHARMASARKAR, R. ZHANG, G.F. VANCE and S.D. MILLER / Micro-Spatial Variability of Soil Nitrate Following Nitrogen Fertilization and Drip Irrigation 605–619

N.D. URI / Factors Affecting the Use of Conservation Tillage in the United States 621–638

R.W. BRADFORD, J.W. YOUNG, V.D. LYNE, T.D. LAMB and K.A. HASKARD / Has Jarosite Dumping at a Deepwater Site off Eastern Tasmania, Australia, had a Measurable Effect on the Midwater Zooplankton and Micronekton Communities? 639–663

Book Reviews 665–670

S.E. Gryning and N. Chaumerliac (eds.): *Air Pollution Modeling and Its Application XII* (I. COLBECK)

J.R. Karr and E.W. Chu: *Restoring Life in Running Waters: Better Biological Monitoring* (D. GILVEAR)

European Environmental Agency: *Europe's Environment: The Second Assessment* (I. MOFFATT)

H. Likke and C.A.M van Gestel: *Handbook of Soil Invertebrate Toxicity Tests* (T. WU and H. AWATE)

Instructions for Authors 671–675

Authors Index 677–679

Volume Contents 681–683